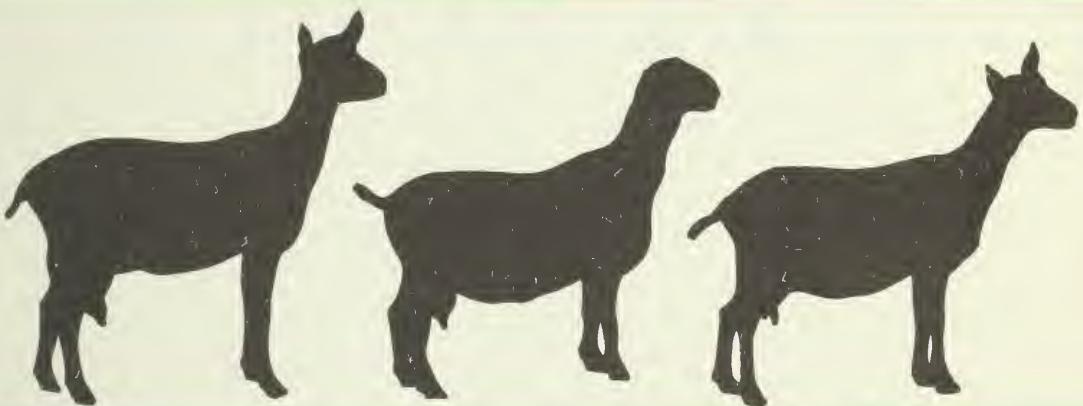


Goats



Agriculture
Canada

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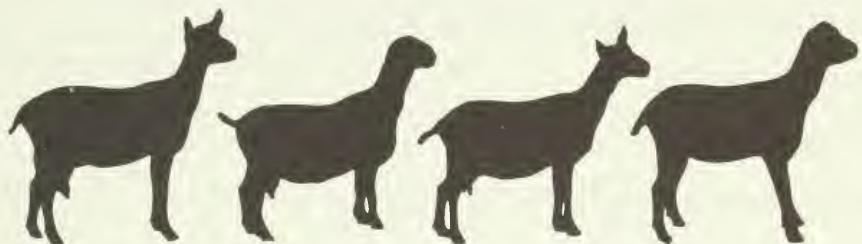
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Agriculture
Canada

Goats



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INTRODUCTION

Pity the poor goat.

For centuries it has been accused of everything from habitually eating old rubber boots and tin cans, to being in collusion with the devil. Surrounded by all this mythology and superstition, as well as a lot of ignorance, the goat has had little chance in North America to show just how productive, economical, lovable and easily manageable it really is.

However, times are changing and the goat's potential, in full-time or part-time farming, is increasingly being recognised today, not only for its milk, but for meat and wool as well.

WHY GOATS?

Before going out and buying your animals, ask yourself why you are buying goats. Is it to be a pet for you and your family, a milk or meat producer, or a self-motivated lawnmower?

Outline your reasons for investing in goats. For every different purpose for buying a goat, there are different qualities to look for in your animals. When buying a goat as a pet, for example, you want a healthy animal. It really doesn't matter if it's a registered purebred or merely a grade goat, a milking or non-milking animal. How much responsibility you wish to take will also affect the type of animal. If you decide on buying a milking goat as a pet, remember, not only will it be more expensive but you have to milk it twice a day, seven days a week.

If you're considering buying a goat as a lawnmower, beware. You will find out quickly enough that goats are unable to tell the difference between weeds and grass, your vegetable patch and rose bushes. Goats are browsers and as such, are very selective eaters. But whatever reasons you have for buying your goats, you will always want healthy animals.

CLASSES OF BLOODTYPE

A newcomer to goats will quickly discover that there exists a large selection of both goat breeds and classes of bloodtype. In general, there are three such classes of bloodtype which the new capriculturalist should be aware of:

THE GRADE GOAT This is an animal of unknown or unregistered ancestry, or whose parents are not registered in either Canada or another country. Goats found in this category may range from worthless scrubs to high-quality animals. It's usually easier and advisable for beginners to start out with grade goats because they are the least expensive and good grade goats, when bred with a registered buck, provide a firm basis for a successful herd.

THE RECORDED (CANADIAN) GOAT This is an animal whose mother is of unknown or unregistered ancestry but whose father is a registered buck. Consequently, it has been upgraded by the introduction of blood from registered stock. All such goats must be recorded by the Canadian National Live Stock Records (CNLSR) in Ottawa. A first generation recorded goat is one half purebred, a second generation recorded goat is three-quarters purebred and a third generation recorded goat is seven-eighths Canadian purebred. Any goat past the third generation is considered purebred.

THE REGISTERED GOAT These are purebred goats whose ancestry can be traced back to those first imported into Canada. These are the animals that are shown in competitions across Canada and, consequently, cost the most money.

Before you go out and buy registered goats, there is one important point to remember; a good grade doe is more valuable than an inferior purebred to your herd's quality in the long run. So consider your budget carefully before deciding what bloodtype you wish to begin with.

BREEDS OF GOATS

There are seven breeds of goats. Of these, five are dairy goat breeds: the Toggenburg, the Saanen, the Nubian (also known as the Anglo-Nubian), the French Alpine (or just Alpine) and a relatively new breed, the LaMancha, sometimes called the American LaMancha. The other two breeds, the Angora and Cashmere, are raised primarily for their meat and mohair. Then, of course, there are the grade goats.

There are no significant differences between these breeds in their temperament and behavior. It is true that Nubians have the reputation of being the noisiest of the breeds, but their most serious crime is a tendency to snore when they are sleeping. No breed is distinctly more gentle or manageable, but the new capriculturalist will soon discover that every breeder has his own favorite breed. Management is more important than the breed when considering milk production. Also, you will find there are greater differences within breeds than between them.

Climate is not a consideration for capriculturalists. Goats of all breeds are well adapted for our climate, with the possible exception of the Nubian. Its long ears require a little extra protection during freezing weather, in terms of a warmer shelter. But this added care is not truly significant nor demanding upon the owner.

The Toggenburg

These hardy, medium-sized goats were developed in the Toggenburg Valley in Switzerland. Their coat is brown — any shade from dark chocolate to light fawn — with white markings.

Good does will produce 5 to 7 L of milk daily during the peak of their



The Toggenburg

lactation, with an average of 4 L. On official testing, does of this breed produced an average of 860 kg of milk and 33 kg of butterfat during a 10-month lactation.

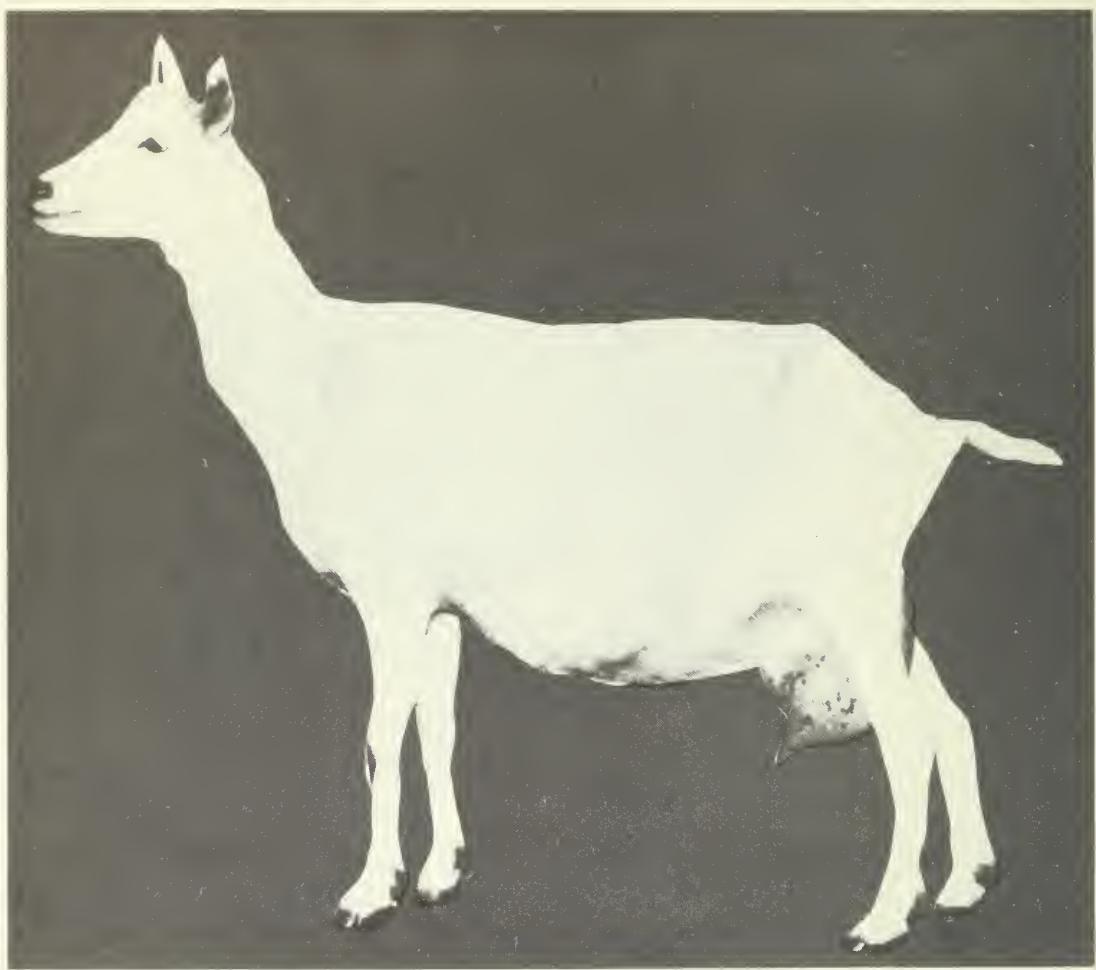
The Saanen

The Saanen is another breed developed in Switzerland, coming from the Saanen Valley. They are the largest of the Swiss breeds and are white or pale cream in color.

The Saanen is a good milker, does of this breed averaging 820 kg of milk during a 10-month lactation period. At the peak of production, a good doe will give 6 to 8 L per day.

The French Alpine

While its actual origin is a little obscure, the French Alpine goat originated from breeding Swiss and French goats found within the Alpine regions. Hence its name. The Alpine may have any color, or combination of colors, with darker spine, face and hindquarters being a common pattern. Occasionally an all-white Alpine will show up, but this is something that breeders try to avoid because it then resembles the Saanen.



The Saanen

The Alpine is a large, graceful goat with the largest milk production of all the breeds. In official tests, does gave 1020 kg of milk and 38 kg of butterfat during a 10-month lactation period.

The Nubian

This breed was developed in England by crossing English does, mainly of Swiss origin, with bucks from Nubia, in Upper Egypt and Ethiopia. They have a distinct head shape with a Roman nose and long, pendulous ears. They are a large animal, like the Saanen and French Alpine. Nubians range through every possible color and combination of colors. Their coat is shorter and glossier than the Swiss breeds. Nubians prefer warm climates, although with good housing in winter, they adapt well to any climate the other breeds can tolerate.

On the average, milk production is a little less than that of the Swiss breeds, but through selective breeding the gap is being narrowed. Does on official test gave 716 kg of milk and 32 kg fat in a 10-month lactation.



The Alpine

The LaMancha

This is a new breed of dairy goat in Canada. LaMancha goats are recognized as a separate breed only in North America. Their outstanding characteristic is the very small ears — with the 13 mm "gopher ears" being the ideal. This is a dominant genetic trait; a LaMancha buck bred to a doe of any other breed will impart this character to the offspring. They are stocky in build, hardy, and of any coloring. The LaMancha's tendency to be independent and yet cooperative gives it a good dairy disposition and its hardiness is well suited to Canadian conditions. Milk production is comparable to the other breeds.

The Angora

While Asia Minor is regarded as the Angora's homeland, the breed originated in the mountains of Tibet along with the Cashmere goat. It thrives in dry climates; wet weather deteriorates its fleece.



The Nubian

This goat has a fine head with fleece growing well over its forehead. Its ears are wide, thin and pendulous. The horns are flat and taper gradually to a point. The actual direction of the horns depends upon sex. The horns of the male sweep back and then twist forward, with the tips pointed slightly up. The horns of the female are the opposite.

The actual size of the goat varies, but the Angora's chief feature is its coat. This is characterized by a long, finely textured fleece. Much like the better quality sheep, the best Angora goats have little hair in the fleece. On the average, a full-grown Angora will produce around 2.7 kg of fleece yearly; some rams produce between 4 and 5 kg. The meat of the Angora is also regarded as the best chevon.

The Cashmere

The Cashmere's home is the mountainous regions of Tibet, some 4500 m above sea level. It is the altitude and cold weather that makes this breed of goats unique. This weather encourages the development of a fine undergrowth of wool from the roots of the goat's hair. The quality of this wool deteriorates in milder climates.



The LaMancha

The Cashmere resembles the other dairy goats more than does the Angora. It is usually small with a short, delicately shaped head, thin ears and small bones. However, it does share with the Angora the same twisted horns.

Also like the Angora, the distinguishing feature is its long, heavy coat. Where the hair is longer, there is more of the fine wool undercoat. This wool appears in the fall and is shed in the spring. It is best collected by careful combing over a period of two weeks. Don't be dismayed over the quantity; even the best Cashmere goats will produce only around 0.25 kg.

HERD BUILDING

To buy kids or adults?

Once you have identified your reasons for buying goats and have chosen the appropriate type or types of operation, you have reached the stage where you actually select the animals that will form the nucleus of

the herd. One problem the new capriculturalist will encounter at this point is whether to buy kids or adults. Both have their merits and their problems.

If kids are purchased, they will need to be looked after for at least a year before you get either offspring or milk. But despite this lag in any returns, by buying young stock you can raise and train them your own way. Thus, any future problems with the goats will be your own and not carry-over problems from another herd. Furthermore, while most breeders refuse to part with their best milkers or does, they are often willing to part with the offspring, especially if they already own a large, established herd.

On the other hand, there are a number of advantages for the beginner when adult goats are bought. Most important perhaps is that an adult animal ensures a quick return on any investment in terms of kids, milk production, meat production or mohair, depending upon the type of operation. In fact, these returns may be sped up even more by buying does that are already bred. But here caution is advisable — investigate the buck carefully. While you could possibly lose a number of productive years in terms of breeding years through buying a mature animal, you can see firsthand the animal's potential, its assets and liabilities in desirable dairy, meat or mohair characteristics. All in all, these attributes can easily offset the need to retrain the goat to your own unique ways and housing facilities. The choice between buying kids or adults is ultimately up to you and your future plans.

To determine the age of the goat study its teeth. Goats, like sheep, have no teeth in the upper front jaw. When born, or shortly afterwards, the kid has eight teeth on the lower front jaw known as the kid or sucking teeth. At about 12 months of age, the center pair drop out and are replaced by a pair of broad, strong, white permanent teeth. At about 2 years, another pair of sucking teeth disappear and a second pair of incisor teeth take their place. This process goes on until all the sucking teeth are gone and eight permanent teeth are acquired. This usually takes place at about 4 years of age, but occasionally teeth develop much more quickly and the goat may have all its permanent teeth by the time it's 3 years old. Still, the teeth provide a reliable indicator of the goat's age.

How many goats should you buy?

As you go about establishing your basic breeding stock, don't run out and buy too many goats too fast. Begin with just a few and learn from these. As your experience and expertise grow, expand. When starting too fast, unexpected expenses can result for the beginner. You can easily develop housing and feeding difficulties as well as a wide assortment of managerial problems that ultimately will end up costing you more money. More important however, by starting too fast, the quality of your herd might suffer. The most successful capriculturalist is a person steeped with patience and who is selective in building his herd.

Papers

If you are buying registered or recorded stock, be sure to get in writing from the seller at the time of purchase a dated receipt which includes the animal's tattoo information, sex, age, and a copy of the registration and a written guarantee that transfer or registration papers will follow promptly. If the animal is bred when purchased also request from the seller the service certificate that originated from the breeder (see section on stud service).

Copies of these forms are available from the Canadian National Livestock Records Office in Ottawa.

Choosing a doe

While most of the qualities desirable in your does depend on the type of operation you are planning, good body development is essential. The doe should be well grown, healthy in appearance and standing squarely on her feet, not down on the pasterns. The body should be wedge-shaped and sharp at the withers, but with great spring and depth of rib, showing her capacity to consume large amounts of food. The thighs should be thin, providing plenty of room for a round, well-attached udder of fair size.

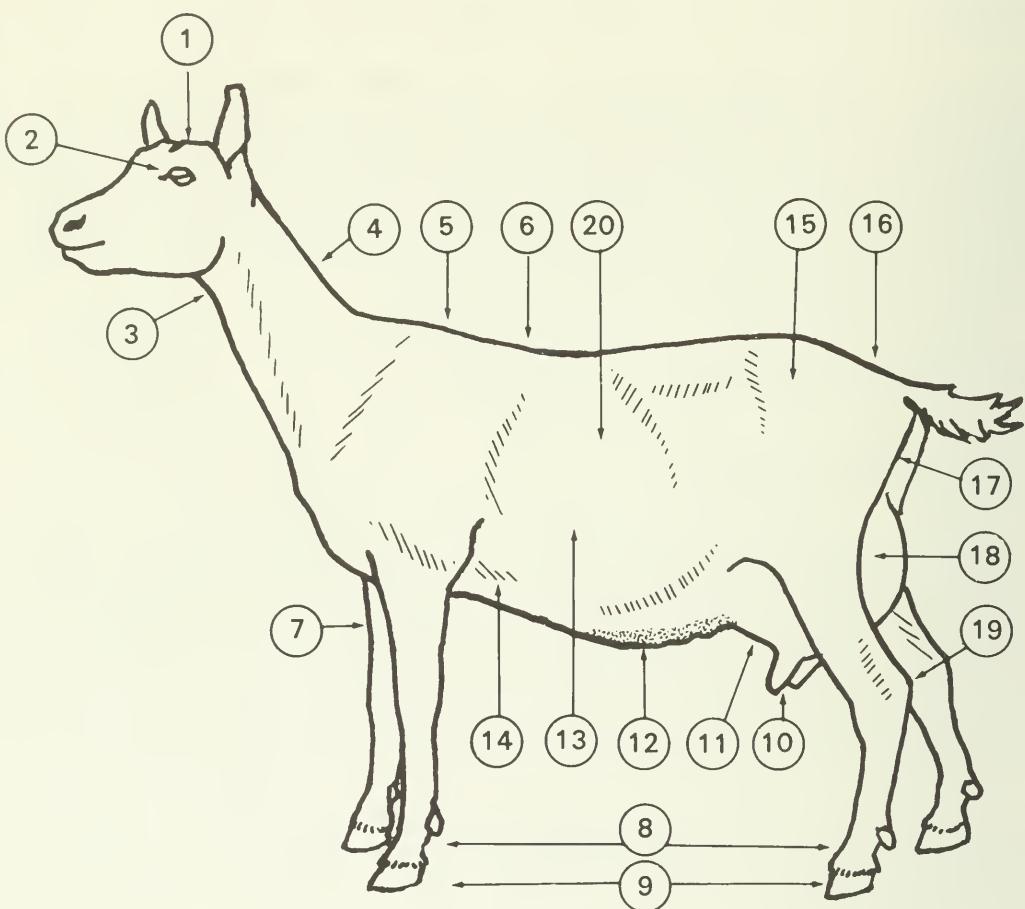
The skin of the doe must be loose, pliable and free from dryness and her hair should be fine and silky. The dairy goat has a lean appearance, not heavily fleshed or fat. On the other hand, you want a meat goat that is heavily fleshed or fat.

Look for a neck that is thin and graceful, with or without wattles. Her head should be narrow with eyes that are clear and bright. Good does have a truly feminine appearance and are mild tempered. Highly nervous goats are difficult to handle, feed and manage, and may upset other members of the herd. This could result in losses to the owner.

A good milking doe produces an average of 4 L of milk per day. However, the milking potential of a dairy doe cannot be estimated by the size of the udder. A large udder may give very little milk, especially if it is fleshy and lacking in quality. That of a good milking doe is thin-skinned rather than meaty, with teats pointing slightly forward. When freshly milked, the udder should be soft to touch and have a collapsed appearance.

Choosing a buck

While choosing does of high quality will be foremost in the mind of a new capriculturalist, never forget that the buck is still vital to your herd. Thus, take extreme care when choosing a buck since your decision will affect your herd for years to come.



1. Head, pleasing, placid and intelligent.

2. Eye, bright and gentle.

3. Throat, clean and fine.

4. Neck, long, and not coarse.

5. Shoulders, clean and neat.

6. Back line, long and level.

7. Fore-legs, straight and sound, not too close.

8. Pasterns, fairly straight.

9. Feet, sound and neat.

10. Teats, tubular and pointing slightly forward.

11. Udder, spherical, firmly attached, silky, not fleshy, halves of equal size.

12. Milk veins, prominent and winding.

13. Barrel, showing capacity.

14. Body, deep, allowing heartroom.

15. Pelvic development, broad and wide.

16. Rump, sloping gradually, not dropping suddenly.

17. Escutcheon, wide and reaching high.

18. Rear udder, developed, balanced.

19. Hocks, wide apart and straight.

20. Ribs, deep and well sprung.

Parts of the doe

There are many factors to consider when choosing a buck. First, analyze the strengths and weaknesses of your does. Knowing what characteristics you want to eliminate and enhance is essential in your search for the ideal buck. Always keep in mind the type of operation you are undertaking, but regardless of the operation and the specific characteristics you need in an animal, again you will want a healthy, vigorous buck that you can depend on for many seasons.

Always use a purebred buck. By studying its lineage you will be better able to identify the best buck for your herd and be confident of the choice. If you have grade goats, choose a buck that most closely resembles the breed of your does. As already mentioned, breeding grades with registered bucks will upgrade the quality of your herd over time. It also makes good economic sense in the short run because you will be able to command better prices for recorded offspring than for randomly bred goats.

For a meat operation, look for a buck that has a tendency to gain weight quickly and sire multiple births. Nubians, as a rule, have more triplets and quadruplets than the other breeds and also have a better carcass yield (more meat with less bone). However, the Swiss breeds gain weight faster.

In a dairy operation, your aim is to increase milk production. Try to find a buck from a doe who has proven her milk production capability in an official test over a 10-month lactation, such as under the Record of Performance program administered by Agriculture Canada, or from a doe who has won a Star Milker Certificate. Again, always research the lineage of the buck. Make sure it contains the qualities you are looking for. If you are considering a mature buck, look at the production of its sisters and, if there are any, its daughters.

In general, for any operation, you will want a buck that shows good size, good depth of body and spring of ribs, a broad, strong powerful chest and well-spaced strong straight legs. He should have well-developed sexual organs with a prominent scrotum and two widely spaced teats. The head should be strong, with or without horns and masculine. Make sure his hair is fine, healthy and that he is free of parasites, either external or internal.

Also consider the buck's disposition. If he is frequently handled and treated in a kind fashion, he will be affectionate and gentle. But always be careful around a buck because it is a very powerful animal.

If you're buying a young buck to groom as a herd sire, be sure to get from the seller at the time of purchase an agreement whereby the seller guarantees either a replacement that is acceptable to you, the buyer, or a total refund if the buck turns out to be sterile or impotent. Remember, it is your responsibility to get such an agreement from the seller.

Stud service

If you own just a small herd, it might well be pointless to go and buy your own buck. Not only might the costs of housing and feeding him exceed his worth if he is to breed only a few does, but more important, after just a few seasons you will own a herd dominated by his daughters and you will have to either sell him or make other arrangements with fellow breeders. There are a number of ways to get around this situation. One is to board another breeder's buck for free in return for use of his services. Another is to arrange with other local breeders to own a few bucks and move them around the farms.

One final way is to employ another breeder's buck. This is known as a stud service. If you decide to use such a service, make sure to receive a service memo form, filled out properly by the buck's owner at the time of the mating. It should include the name, breed, tattoo and registration number of the buck, the date of the service and the expected kidding date. Be sure it is signed by the buck's owner.

This memo is crucial if you wish to register the offspring in the special registry at the CNLSR. Also, make written arrangements with the buck's owner for free return service if the doe fails to settle.

BREEDING DOES

The breeding season

Goats are seasonally polyestrous, which means that they enter into heat many times during the breeding season, although they do enter into estrus at any time during the year. A doe will begin to show distinct signs of estrus near the end of August and will continue to cycle until she has been bred, or until mid-February. However, the actual time that estrus will begin depends in part on the weather. If it has been a long, hot summer, it is possible for a goat's cycling not to begin until late September or early October, when cooler weather has arrived. Goats will continue to cycle every 19 to 21 days. The period of heat generally lasts from 1 to 3 days.

For new capriculturalists who are interested in starting a dairy goat operation, there is the additional problem of circumventing seasonality to maintain a more constant, year-round supply of milk. Consider applying staggered breeding schedules. It is possible to artificially induce estrus through environmental control — manipulation of the hours of daylight and darkness — or hormonally. You might also consider breeding for long-lactation milkers that can be milked through a second season without being rebred.

Bucks are most sexually active in the fall and winter months. During this period, they emit a very strong odor that some people find offensive. This can be lessened by keeping them clean. A young buck, aged 12 to 18 months, can breed between 20 and 25 does in a breeding season; a mature buck will breed any number between 40 to 50. If not used too often, a kid buck may begin his career at only 6 months.

What age to breed kids?

Many breeders in the past used age as the critical factor when considering breeding their stock. As a rule of thumb they would often wait until the doe reached nearly 18 months of age. Today, more and more capriculturalists are realizing that the doe's weight is more important than her age when it comes down to breeding decisions, and are citing two very clear advantages for this. First, a fast-growing kid may become too fat by the time it has reached 18 months of age and this leads to problems when the doe is settling and kidding. Second, by breeding kids to freshen as yearlings, an extra year is added to their productive life.

A kid should weigh at least 34 kg before she is bred and it is quite possible she'll reach this weight by the time she is only a year old. Breeding a kid before it reaches this weight, while it will not impair her ability to produce healthy kids, may well stunt her own growth. At this stage, remember that the goat's size is a genetic characteristic and that some, no matter how much they are fed, will always remain small. Here is another reason why it's important to be aware of the animal's lineage.

Should you isolate the bucks and does?

Whether you let the bucks and does run together or not depends solely on the type of operation. If it's strictly a hobby, then housing the bucks and does together provides greater convenience for you. Often, by being with the does, the bucks tend to develop gentler, more sociable temperaments and you never have to worry about heat cycles.

Anyone running a meat operation will find that, as with hobbyists, permitting the bucks and does to run together is a good practice in general. By doing so, does are more likely to be bred during the late breeding season when the heat periods are less pronounced. However, give some attention to the type of buck breeding your does so that the quality of your herd is improved (see "Choosing Your Buck").

The dairy goat operator is wiser to keep the bucks isolated from the does. This is the only way you can keep a hold on a scientific breeding program and maintain staggered mating. It also ensures that the milk is not contaminated by "buck odors".

Signs of estrus

When in good, strong heat a doe may wag her tail constantly and rapidly, bleat incessantly or show signs of greater aggressiveness than normal. She may ride other does, or permit herself to be ridden. Her appetite might change for a few days and her milk production may drop slightly. Her vulva will redden and swell a bit, and a slight mucus-like discharge may be apparent. If you have a buck quartered nearby, he and the doe will show greater interest in each other during the doe's heat period.

There are, in fact, many different indicators of estrus and different does will show different combinations of these. The beginning capriculturist should also be aware that some does have extremely short, or 'silent' heat periods. It is therefore very important to maintain proper records. Note any unusual behavior by the doe. If she shows these same symptoms again in 19 to 21 days, then you have probably been successful in identifying the doe's estrus.

Knowing this also is very valuable in determining whether the doe has been bred. Make a note of the date of service, then watch for any signs of estrus in the following cycle period. If the symptoms fail to occur again, then it is safe to assume she has been bred.

A doe may be receptive to a buck from only a few hours to several days. However, generally you can depend on a goat being in heat for 36 hours. Here again, keep careful records of your doe's individual characteristics.

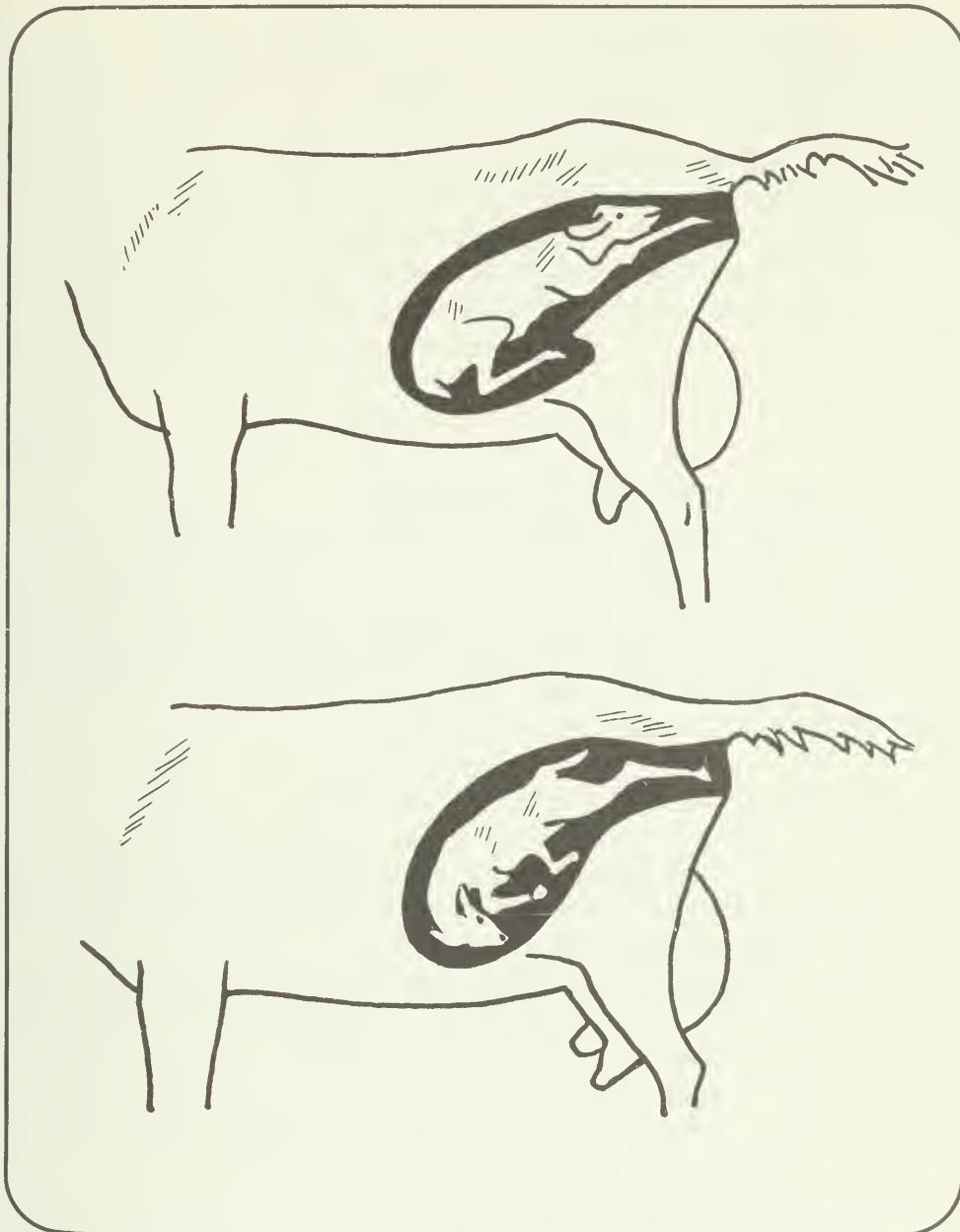
Care of a pregnant doe

The normal gestation period for a goat is between 150 and 152 days, or about 5 months. Goats are remarkably reliable so, for the 17 weeks following the day the doe failed to cycle, be extremely gentle when handling and caring for her.

During the first 3 months of pregnancy, first time fresheners, does that have not been bred before and adult does must all receive different care. If the first freshening doe is a well-developed yearling, all that is required is that she be kept on basic maintenance rations of concentrates. However, if she is a 10 to 12 month old doeling, then you must give her enough protein to nourish the developing fetus while still permitting her to grow normally. Increase her feed gradually until she is eating approximately 0.5 kilogram of concentrate daily, with some hay.

The care of an adult doe is somewhat more complex than that of a first freshener. During the initial 3 months, feed her according to her size and lactation. If she gave birth to her last set of kids in late winter or early spring and was rebred during the fall, as is the usual pattern, then her lactation will begin to taper off during this period of pregnancy. As it does, gradually reduce her feed until she too is on basic maintenance rations at the end of the 3 months. Care must be emphasized here. Don't reduce the rations too fast for the goat. A doe must be dried completely for at least 2 months before anticipated kidding.

As you reduce her rations and milk production drops, encourage this trend by drying off the doe. This means end milking her. It will give her mammary glands the opportunity to rebuild themselves naturally in preparation for new kids and a new lactation. This may be done in one of two ways. Either stop all regular milking, doing so only when the udder is tight and it is necessary to reduce the pressure, or gradually increase the time between milkings. It is currently recommended that the first method be used. The goat should be milked 4 to 7 days after stopping regular milking. This practice reduces the chance of invasion by mastitis organ-



Normal birth positions

isms. Whichever manner you adopt, keep with it until the doe is completely milked dry. During this process, reduce her grain and water intake as well.

After the first 3 months have passed, both first fresheners and adult does are cared for in the same manner, as the stress of pregnancy increases dramatically. Some 60 to 70 % of the fetus' growth occurs in the final 6 weeks. This means that the doe will require more energy and vitamins during this time than before. Provide her with more feed, but increase it gradually. Also, make sure the doe does not get fat — a fat doe has more problems at kidding or freshening time. To help satisfy the doe's vitamin requirements as she enters the critical final month, give her a shot containing vitamins A, D, E and B₁₂.

In the final 8 weeks, the udder will again develop as the milk-producing mammary glands prepare to enter into production. A doe may actually start to produce milk before kidding, but it's not usually necessary to milk her. Do so, and then not completely, only if there is excessive congestion in the udder. Partial milking is sufficient to reduce the pressure in the udder. If you notice that the milk is somewhat yellowish and is very thick, don't worry. Because the milk in the udder may be several weeks old, natural secretions have enough time to cause this coloration.

About 1 week before the due date, begin to feed the doe a 25% bran ration. This puts her into a more laxative state which makes kidding less stressful. Isolate the doe from the rest of your herd, in a clean, dry, draft-free place. Make sure there's lots of bedding material in the stall. Not only will the doe be protected from other does, but you will be able to observe her better as the due date approaches.

Two days before the expected kidding date, cut back the concentrate ration to relieve stress on her digestive system. It's a good idea to carefully inspect the doe regularly from here on, if you haven't already begun to do so, for any signs of impending kidding. Also inspect her at this point for evidence of external parasites; if you find any, deal with them before the kids arrive.

Abortions and stillbirth

Abortions will occur from time to time in your herd. These may be caused either by diseases that affect a number of your does or other conditions that affect only isolated animals.

A number of infectious conditions can cause abortions. These include vibriosis, listeriosis and brucellosis. The existence of such a condition is easy to identify in your herd because it will affect a larger than usual number of does, who abort for no apparent reason. If you suspect some disease is present, call your veterinarian immediately and isolate all the does that have aborted until tests have been completed.

Abortions not caused by disease also occur, but only in isolated cases. These may be caused by such things as stress, shock or physical injury.

Stillbirths, or mummified kids, do happen every once in a while. Don't be alarmed by them. It's quite possible that the fetus may contract some infection in the womb and die, or it can drown during kidding if the umbilical cord breaks prior to actual birth. The occurrence of a stillborn kid will not affect the doe's ability to produce other kids.

Signs of impending kidding

Through her behavior, a doe may show clear signs that the day is arriving. One sign is "nest building" — pawing the straw bedding — or she might be restless and lack interest in food.

There might also be physical indicators that you can identify. A vaginal discharge does occur, but this may appear at any time from

several hours before labor begins, to just before actual kidding. In anticipation of the kid's arrival, the doe will dramatically increase its milk production a few hours before labor begins, with the udder taking on a shiny appearance. The vulva may also become very swollen.

However, many does never show any distinct signs at all before they enter labor. They just get down to business without any warning. This makes knowing the due date very important. As already suggested, begin checking the doe carefully a few days before the due date and continue to do so regularly; chances are you will catch your doe as she is approaching or even entering kidding.

Kidding

Try to be present at kidding time, to help your doe if she needs it.

When heavy labor begins, your doe will strain visibly, often crying out with the heavier contractions. The 'water bag' will appear first and inside you should see two front hoofs, with the kid's muzzle tucked a bit behind and between its legs. Don't be alarmed if you see the two hind hoofs rather than the front ones. Either way labor should be a straightforward affair. Don't be in a hurry to break the water sac, as it usually breaks on its own. If, however, you see this is not going to happen, break it and wipe the kid's nostrils and mouth clean as soon as its head is free. If the head is large, then help the doe by pulling a bit on one foreleg, then try to push the skin of the vulva past the kid's head and pull a bit on the other foreleg. Be gentle, pulling when the doe contracts and relaxing when she stops. Always move in rhythm with the goat. Once the head is out, the remainder of the kid slips out quickly. The umbilical cord usually breaks on its own when the kid is out so do not worry about it until that point is reached.

Sometimes there is difficulty in expelling the kid because one or more legs is bent back or in another abnormal position. It is easy to tell when the doe is encountering difficulties. If she is straining and struggling, yet nothing seems to be happening, it is time to investigate. Disinfect your arm, clip your fingernails short, apply vaseline to your hand and gently slip your hand inside to find out what is wrong. Be prepared for such a situation; have a bucket of clean, warm water by your side to wash in and any other necessary items such as vaseline and iodine.

If there is a minor problem, like one leg bent back, find the stray limb and pull it slowly into the correct position. However, if it's badly out of place, lift the doe carefully by the back legs, causing the kid's weight to slip it back inside. Put the doe back down and allow her to try again. The actual time it should take for a doe to give birth will vary, but it is usually less than 10 minutes. If heavy labor takes longer than a few hours, get hold of your veterinarian or an experienced stockman. You are the judge as to when help should be called in. Most important of all, don't be afraid to call for help. While serious kidding problems are rare in goats, they can happen.

After the kid is born, tie a string around its umbilical cord about 2.5 cm from its belly, clipping off the excess string and cord. Wipe the stump

with iodine to prevent any navel infection. Wipe the kid dry with soft paper towels or cloth. If the newborn kid fails to show any signs of life, immediately pick it up by its heels and slap its side. Also recheck its breathing passages for any mucus.

Twins and triplets are common so be prepared to catch the next kid. The actual time separating their arrivals varies from immediately to up to half an hour. When all the kids are born, the doe will expel the afterbirth or placenta. This is a dark red mass with light blue veins. While there should be placenta for every kid, it usually is discharged together. It may take up to 24 hours for all of it to be expelled, but try to stay around until all of it is out. Don't try to encourage it by pulling at it. You could tear the doe's womb or leave some inside the womb resulting in serious infection. If the placenta remains in the womb, with no sign that it will be discharged, for longer than 12 hours, it's time to consult your veterinarian. Afterbirth begins to decompose immediately, so if it is left in the womb, it could poison your doe. Also, it might indicate that there is yet another kid to be born.

CARE OF DOES AND KIDS

Care of the newly freshened doe

When kidding is completed, immediately wash the doe's udder and backside and dry it carefully. Make sure her stall is dry and clean, but be careful and don't try to disturb her much as you go about cleaning up.

It is considered poor management to use drugs where they are not required. If you do have to use antibiotics, remember, you cannot sell the milk for human consumption until a specified time (dependent on amounts used) has passed.

Your doe has used a great deal of energy during kidding and has lost a lot of fluid. Set about to rectify this. She usually appreciates a drink of water. Make sure it is warm so she doesn't have to use any additional energy to raise it to her body temperature. Some breeders give their does little treats. These include warm tea and molasses or warm milk with brown sugar, thus giving the new mother a little quick energy as well as a drink.

While the newly freshened doe doesn't need any grain for a day after kidding, it's a good idea to have some available for her. Give her about 0.5 kg of grain for the first few days. This may be increased until you have returned to full feeding level within 6 days. There are breeders who provide their does with a warm bran mash after freshening. This too gives the doe a helping hand in regaining her energy.

Check your doe's udder for any signs of congestion, hardness or mastitis during the days following kidding. For a week or so after freshening, does may have a slight vaginal discharge. Don't worry about this, it's normal.

How should you raise the kids?

Even before the kids arrive, you must make several decisions as to how they are to be raised. Should they remain with their mothers or be raised separately?

There are advantages as well as disadvantages for either choice. The manner you choose depends in a large part upon what type of operation you're running, what your facilities are and how much time you have available for your herd.

The biggest advantage if you decide to leave the kids with their mothers is convenience. If yours is a meat operation, or if you are not interested in using your doe's milk, then go ahead and leave the kids with the does. Make sure, however, that the kids do receive their first milk (colostrum) immediately and that they are in fact nursing. By leaving the kids with their mothers, you also remove the threat of scouring. Scouring is when the kids take too much milk at one time, bloat and have diarrhea. The kids will take smaller quantities of milk more frequently, as is natural. Finally, the kids will learn at an early age to eat hay and grain and drink water.

These advantages must be balanced against some very major disadvantages. There will be more difficulty at weaning time as goats form very strong bonds; when you do remove the kids, you will find that goats can be very vocal in expressing their displeasure. Furthermore, there is no way you can be certain of the quantity of milk being produced by your doe, or how much a kid is receiving. In the case of twins, you'll always find that one is a "pig". You will also find that, unless the kids have been handled frequently, they will be wilder and more skittish.

If you remove the kids from their mothers at birth, you will find there are an equal number of advantages and disadvantages. Kids nursing and poking at their mother's udder tend to cause the udder to break down faster. This is important to breeders who show their goats. Also, by hand-raising your kids, they become gentle and receptive to humans, and you will know exactly how much milk each kid is receiving. Finally, by continuing to thoroughly milk out your doe, she will maintain a longer lactation than if the kids stay with her.

The big drawback is time. Kids must be fed at least three times a day for the first week and then at least twice a day for many weeks following. Thus chores will take much longer and you'll have a lot of extra cleaning up. There is the threat of scouring (or diarrhea) from consuming too much milk at one time and it takes hand-raised kids longer to turn to eating hay and grain and drinking water.

Whichever way you choose to raise your kids, maintain that practice for the season and always keep in mind why you are into goats. For a dairy operation, for example, it is obviously a good idea to remove the kids and slowly place them on a high fat milk replacer with vitamins so you may use the doe's milk. Currently, there are such replacers on the market for lambs and a high protein starter for calves that may be used for goats.

Care of newborn kids

It is critical that newborn kids receive their first milk, or colostrum, within a few hours of birth. It holds a multitude of vitamins, has a high fat content, is laxative and contains many natural antibodies needed to protect the kid until it develops its own resistances.

Colostrum is very valuable, so hold onto any surpluses that may occur. You never know when it may come in handy; if a doe dies giving birth, for example. Store it in sterile containers and freeze it. You will also find it is good for orphan cats, dogs, lambs, calves and hogs. Be sure to thaw it slowly, at room temperature. Excessive heat will break down its essential ingredients.

There are dangers of infection entering through the umbilical cord as you tie it shut. This may cause a condition called *joint ill*. It cripples the kid with severe and painful swelling of the joints. The kid will not be able to feed and eventually dies of starvation. Watch the kids very carefully. If there are any signs of joint illness, contact your veterinarian immediately.

Feeding kids

If kids are to be taken away from their mothers do so immediately at birth, and place them either on pan feeding or bottle feeding. Use a regular baby bottle and nipple, some of the newer baby feeders that lessen air swallowing or a lamb nipple. Occasionally, the hole in the nipple may have to be enlarged to enable the kid to draw milk from the bottle. Keep both nipple and bottle thoroughly clean.

To pan-feed, place warm milk in a shallow pan and gently urge the kid's lips into the milk. Usually this is sufficient. Because pan feeding is fast and efficient, many breeders with small herds prefer this method. During the first week, approximately 280 mL may be fed three or four times daily. After the first week, the feeding periods may be cut to three times daily and the amount at each feeding increased, as the kid develops, up to a maximum of 2.3 L for doe kids and 2.8 L for bucks per day. Twice-daily feeding will suffice for kids over 1 month old. Excessive milk feeding will produce exceptionally nice looking does but they have improper stomach development and will subsequently be low milk producers. Overfeeding may cause bloat, scours, or enterotoxemia. The milk should be fed warm, not less than 40°C. Milk that is too cool will cause upset stomachs.

At an early age kids should be furnished choice legume hay (very little alfalfa) and some grain, consisting of one part cracked corn, one part rolled oats and one part bran. As the kids develop, the rolled oats may be replaced with whole oats, and milk feeding may be discontinued at about 4 months of age. Some breeders prefer to extend the milk feeding up to 7 months if the supply is plentiful. Kids should also have from birth a high protein starter, currently available for calves.

Weak or runty kids

Every once in a while an extremely weak kid will be born. Expect such an event. While weakness is common and should correct itself in a matter of days through proper feeding and exercise, the very weak, or runty kid, does require additional attention if it is to survive.

It is a good idea to bring it into your house. It needs to be kept warm and dry and have many small feedings over the day. By having the kid near you, it will be easier to attend to its needs properly. You may have to use an eyedropper when feeding the runty kid as it may be too weak to suck. Some breeders give such kids a little something to help them along. One puts a drop or two of whiskey and a little molasses in the milk.

Also give the animal some extra vitamins and iron, as well as some antibiotics. If you have any spare colostrum, give it some extra.

Horns

All breeds of dairy goats have some horned and some polled (hornless) individuals. There is no hornless breed. The genetic factor for horns is believed to be linked to the sex factor; if the factor for hornlessness is inherited from both parents, the female fetus undergoes a sex change (male fetuses are not affected), causing a sterile mixed-sex animal, a hermaphrodite. Sometimes the condition is obvious, but it is the apparently "male" or "female" hermaphrodite that causes the greatest problem, for their sterility makes them a non-paying burden to the herd, and it may take several years to discover. You can avoid this problem by making sure at least one of the parents (buck or doe) is horned. Most herd owners prefer to have only horned bucks (disbudding or dehorning has no effect on the offspring), thus eliminating possible hornless-to-hornless matings.

The horns of the Swiss breeds taper, and point outward, toward the rear. They grow fast; about 20 cm long or so, by the time the kid is a yearling, after which the growth slows down. The Nubian's horns do not erupt as early as the Swiss breeds — where the latter's horns may sprout at 1 to 8 days of age, the Nubian's horns may not sprout till it is about a month old. Their horns have a slight twist, bringing them out to the side with a flatter top surface. Angora's horns are a slow spiral. LaMancha's horns are similar to those of the Swiss breeds.

It is always wise to remove the horns from dairy animals, especially if they are confined in a pen or stalls, or by wire fences. The horned goat could get trapped by sticking its head through a space that the horns prevent getting back out of. The horns are more of a dangerous nuisance than a defence, and in fact are of little help against an attacking dog. If some goats in the herd are horned, they will bully the non-horned ones.

Disbudding the kids

Some kids, especially well-grown buck kids of the Swiss breeds, are already beginning to sprout horns at birth; most start at 3 to 8 days old. The skin on the head of the polled kid will move freely across the horn area when rubbed by a finger. The horned kid's skin will seem attached to the skull at the horn sites. Also, most horned kids have a whirlpool of hair around the horn buds. Feel their heads daily; if you notice the horns are growing it is time to disbud the kid. The horns may get as high as 6 mm above the skull, and still be burned off with little trouble. Any higher, and it is increasingly difficult to fit the hot iron over them properly; dehorning pastes used at this time will just deform the horns, not stop their growth.

When restraining the kid for disbudding, be careful not to choke it. It is natural for the kid to cry out; do not allow the noise to distract you from doing a proper job, or it may have to be done again later to remove what you missed.

The horns of the goat are more difficult to stop than those of cattle. If using a red-hot iron, about 2.5 cm diameter, burn about 10 to 15 seconds, until the horn bud comes off. Then sear the entire area where the horn bud was, down to the skull. Be careful to keep the ears out of the way. Once the horn bud is done, apply a dressing, such as pine tar. This is to cool the wound, keep flies and dirt out, ease the pain, and promote healing. Then proceed to the other horn bud. If using a chemical (non-drying pastes are very dangerous; goats are more active than cattle and try to rub it off on any place handy) follow the instructions for use very carefully. There are some dehorning pastes that dry hard like nail polish; these are safer. Check weekly for the next few months, to see if scurs (deformed leftovers of the horn) are growing. If so, burn the scurs to stop them and apply dressing.

If you are thinking of dehorning, consult veterinarians and experienced dairy goat breeders. This is not something to attempt unless you know what you are doing.

Castration

Buck kids, unless from a very high quality doe, are rarely worth keeping. They should be castrated shortly after birth, or within 2 months. Male goats are fertile when quite young, and if left with young females, are capable of breeding and causing early kidding. This spells havoc in your herd, so be careful. If the bucks are to be used for meat, then it is best to castrate them at a very young age. It is also easier to do and easier on the buck. Slaughter goats should be raised on milk for the first 2 or 3 months. Then, at 3 months of age, they can be either sold or slaughtered for their meat, called chevon, which is considered excellent.

There are three methods a capriculturalist may choose from. Before any of these are undertaken, a tetanus vaccine is recommended. They are:

THE ELASTRATOR This machine places a tight, heavy-gauge elastic around the scrotum of the buck, cutting off all circulation to the testes and causing them to shrivel away to nothing. This method should be used when the buck is very young, between 2 days and 2 weeks of age. There is no pain or irritation, as well as no bleeding or threat of infection. It is also 100% guaranteed to be successful.

THE BURDIZZO This is an emasculating tool that crushes the spermatic cords. Again, it is painless and bloodless, but, if you are not familiar with how to do it, it may not be 100% effective. There remains the chance that one or more of the cords could remain intact. This method is best used on bucks aged 2 months or more.

SURGERY This is straightforward and is best on animals aged 1 to 2 months old. There is no pain and little blood, plus it too is 100% effective.

Inbreeding and artificial insemination

Inbreeding, by definition, is the mating of closely related animals. Its aim is to accentuate and strengthen the good qualities exhibited by the line, while minimizing the weaker points. Of course, there is always the chance the reverse may occur, so if you undertake this form of breeding, make sure you can cull, or remove from your herd, any kids which fail to meet your expectations. It is not a good policy to retain these inferior kids, as they will pull down the quality of your herd.

In the United States a successful artificial insemination (AI) program is already established and there is preliminary experimentation underway for such a program in Ontario. The advantages of having such a service are numerous. There will be no need for most goat operators to even own bucks, thereby reducing the feed requirement and other costs. Extensive records of production will become available. Finally, and probably most important, it will be very easy to introduce new bloodlines into your herd.

HOUSING AND MANAGEMENT OF GOATS

Before you go out and buy your goats consider the facilities you have available: fields, shelter, storage areas and so on. Unless you plan on building facilities to suit your needs, what there is available for use might well dictate how many goats you can acquire.

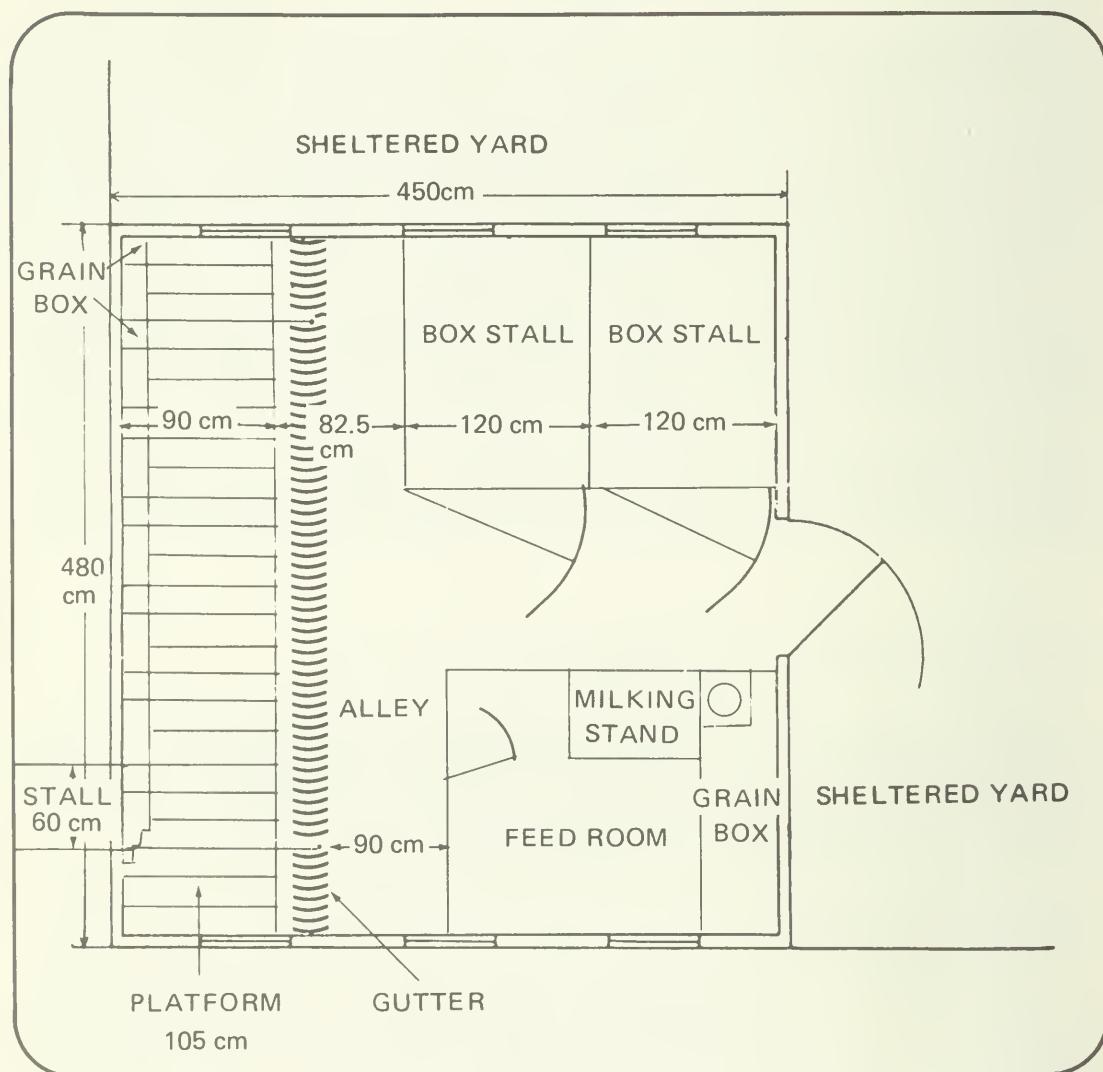
Housing goats

The building used to shelter goats must be free of drafts, well insulated and properly ventilated. It should lie on naturally well-drained

land. Old buildings may be remodeled at little cost to comfortably house goats, or they may be built upon. One example of this is a lean-to, which may be built at minimum expense on the sheltered side of any existing building.

Whatever style of building is used, it should be placed on solid foundations and be big enough to comfortably accommodate the size of herd you wish. Thus it is important to always consider how many goats you ultimately wish.

The floor of the stall areas should be sloped so that liquids may run off. These floors can be kept looking and smelling clean by sprinkling on agricultural lime after the daily cleaning. The lime also makes the floor easier to clean and helps dry it. The wall foundation should be sunk fairly deep into the ground so that rodents will not burrow under and undermine the floor, or cause injury amongst your animals. The building itself should be well constructed.



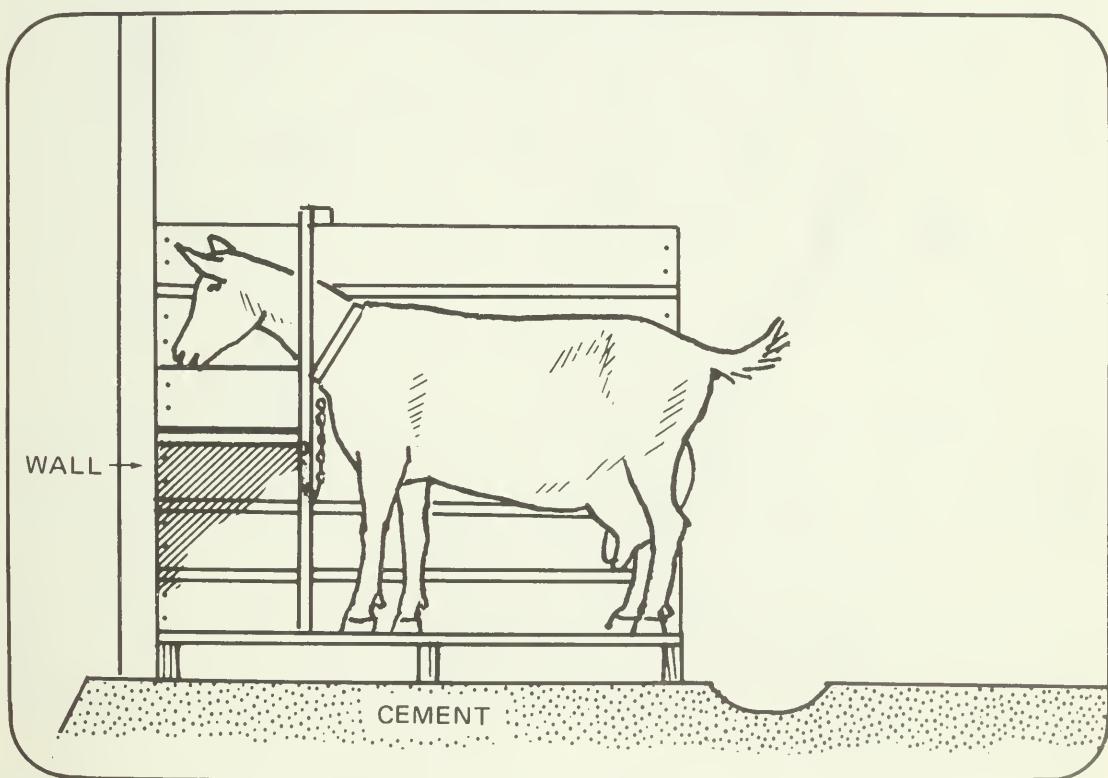
Housing for eight goats and their kids

Windows should line the south side of the building and be hinged at the bottom to drop inwards for proper ventilation and ease of handling. If you're a new capriculturalist who has a limited area to work with, consider using any attic space as a storage area.

Remember, the plan of any goat barn depends largely on the size of the herd and the type of management. The barn shown here provides housing for eight does and a box stall for does at kidding or to hold kids. The plan is laid out to reduce the time necessary to keep the stable clean and to care for and feed the goats.

There are two ways of housing goats to choose from: individually or in community pens. Many breeders prefer pens rather than individual stalls, grouping animals of about the same age or size. For example, all milkers in one pen, yearlings in another and kids in yet another pen. This saves a great deal of work and materials and permits the herd's 'bully' to be confined separately. Be sure, however, not to overcrowd your pens. Goats must have room to move.

Individual stalls, if they are to be used, should be built so that the floor may be washed and disinfected. To prevent the goat from putting its feet into the manger or water, use a chain with a swivel snap to tie them to the manger. It's very difficult to keep goats clean in such stalls even if a slatted floor, which may be removed for cleaning, is used. Where two or more goats are in single stalls near each other, arrange the partitions so they cannot steal each other's food, or bite at each other's ears.



An inexpensive goat stall

Keep goats dry and clean while stabled. Bedding materials such as dry leaves, dry grass, straw, chaff, sawdust or shavings are used for this purpose. Exercise care however, in using roughage for bedding. Illness may result if the animals eat roughage that is mouldy or otherwise unfit for food.

If you are planning to undertake a dairy operation, particularly a commercial one, always house your bucks separately. Milk is very susceptible to buck odors. If you do have a separate field and house for your buck, be sure to supply him with a companion.

Feeding your goats

The basic maintenance rations for a buck may consist of alfalfa, clover and mixed hay along with some concentrate in the form of oats and wheat bran. This is fed to him during the winter months. However, as you approach the breeding season, and during the season, give a mature buck a liberal ration of grain, up to 1 kg per day. Bucks should never be fed mangels, which are a form of beet well-liked by goats, as they cause bloating.

In general, feeds suitable for cattle are also suitable for goats, except that goats prefer coarse ground or whole grains. For dairy does, a large proportion of succulent feed or beet pulp may be added to their rations if available. Rations for does should have a protein content between 12 and 15%, depending on the amount of protein they already receive in their hay and on their milk production. Milking does should receive 1 kg per day of concentrate, according to size, weight and milk production. An excellent concentrate ration includes four parts corn or barley, four parts of oats, two parts wheat bran and one part linseed meal or soybean meal. Such a concentrate will give good results if your animals are fed according to their individual milk production levels. A good rule of thumb is to feed 0.5 kg of this ration for every 1.5 kg of milk produced daily and to provide a minimum amount of 0.75 kg daily to low-producing does. Legume (alfalfa or clover) hay or mixed (legume/grass) hay may be fed to appetite. Succulent feeds such as silage, roots or beet pulp, when added as roughage at 1 to 1.5 kg a day stimulates milk production.

These feed allowances will provide the needed total digestive nutrient (T.D.N.) intake. Should your animals go off their feed, give them a chance to browse and eat some foliage and bark. This helps to restore their appetites. Also, a dash of cider vinegar, either on the feed or in the water, has been found helpful, as is a cupful of molasses in the drinking water.

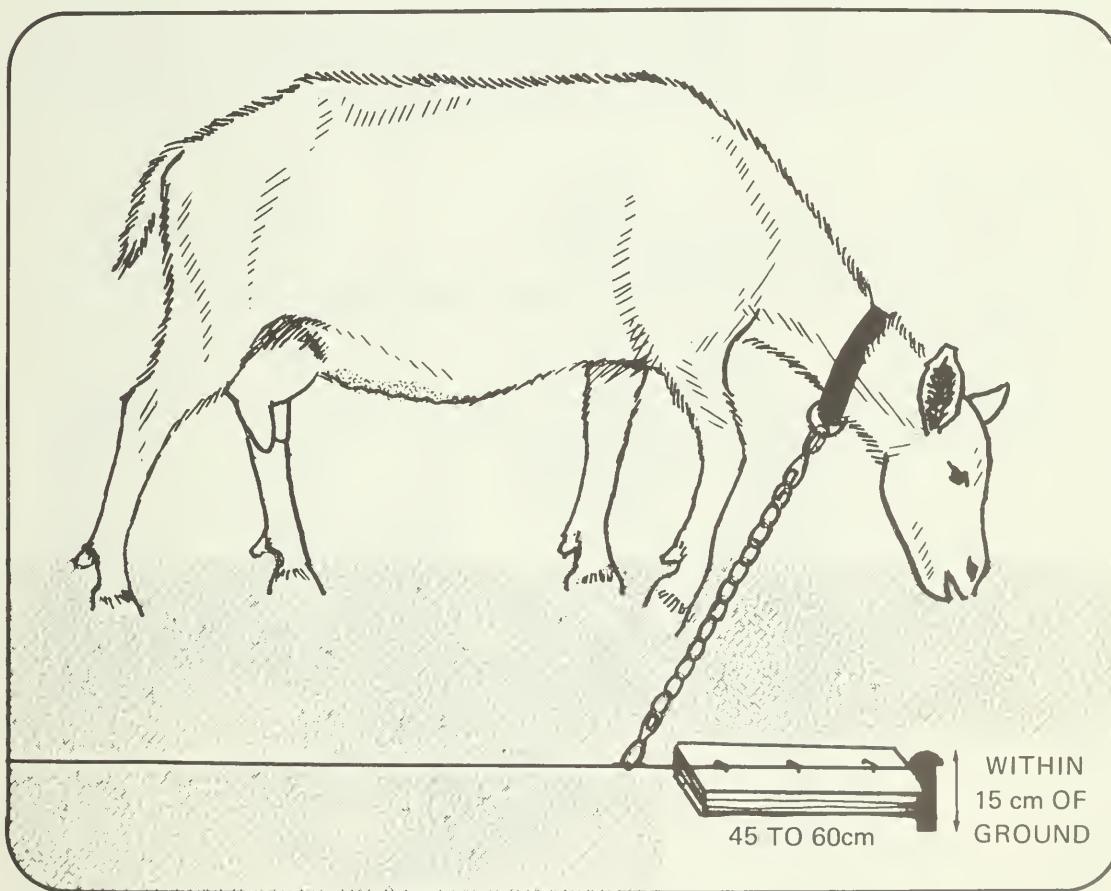
One word of warning; make sure your goats cannot get into the storage area if they escape their pens. They will immediately head for the feed and proceed to eat to their hearts' content. This will not only reduce your feed supply, but your animals may become sick afterwards from too much concentrate.

Fencing in your goats

Goats love to roam, particularly in wooded areas, during the warmer season. Let them out whenever possible. The exercise strengthens your goats and improves their health. However, before you do so, make sure they will not get away and attack either your own vegetable and flower beds, or your neighbor's.

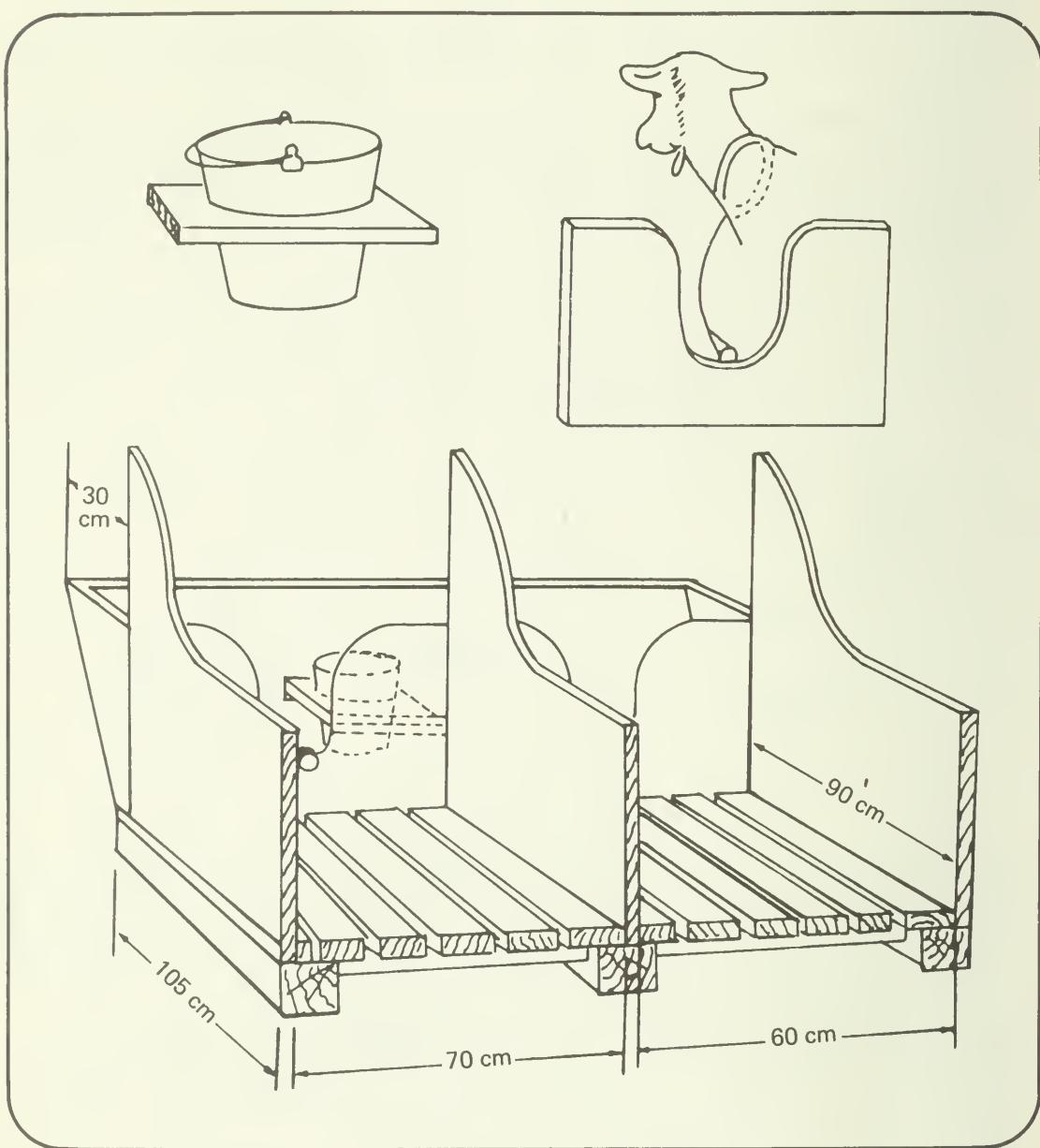
Never use barbed wire fencing around dairy goats. They have no respect for such fences and will climb right through, often getting cut, or damaging their udders and teats. Board fences are best, preferably of horizontal boards spaced no more than 10 cm apart, to a height of 1.20 to 1.80 m. Younger goats, males and dry does alike, will try to jump a fence, especially if they are frightened or unhappy. Placing a smooth wire 15 to 20 cm above the boards will successfully discourage their aerial acrobatics.

It is possible to use chain-link fencing, but it must be a heavy link. Chicken wire is totally useless; it can, however, be wrapped around tree trunks to protect the trees. Page wire, as used for sheep, must be well-supported if it is used. Goats enjoy standing upright and looking over obstacles, so a weak fence will soon be stretched out of shape.



The running tether, showing swivel ring and hook. Board prevents ring from slipping over, or snagging on the stake.

If you do not have large fields, or a large herd of goats, fencing may not be necessary at all. You may decide to tether your animals. The running tether is superior to any other kind. It consists of a length of chain 50 to 100 cm long with a swivel snap on one end, and on the other end, a large swivel ring through which a stout wire is run. The wire is tightly pegged to the ground at both ends and can be as long as you desire. The principle behind the running tether is basically the same as snapping a dog's leash onto the clothesline so he can run the length of the line. Be sure to keep an eye out for any stray dogs or other dangers while the goat is tethered.



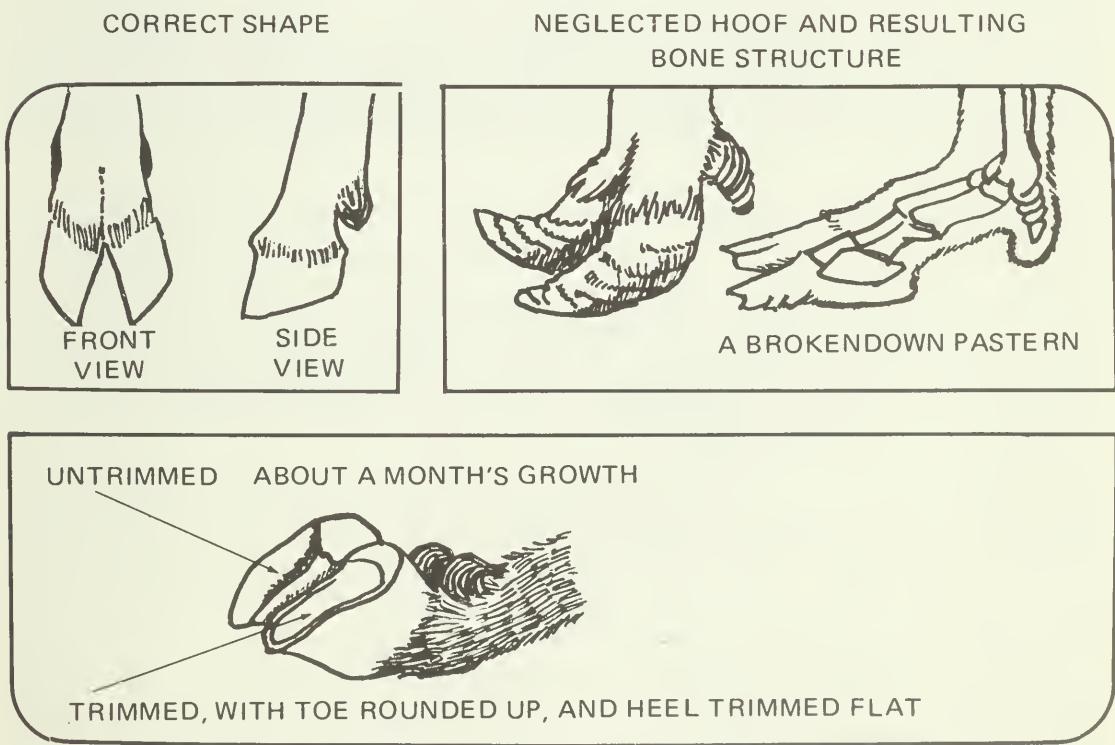
The short platform keeps the manure in the gutter and off the platform. When lying down, the goat is partly under the manger.

Dog collars of leather or smooth chain are suitable for goats. They should be fitted about the same as on a dog — not tight, but just a little loose. If the collar is too slack, it may be snagged on some projecting object; many goats have died of strangulation or hanging, because their collar got hung up and they couldn't free themselves. If you use a choke collar, attach a little padlock so it can't tighten around the neck.

Maintenance and the health of your herd

To be a successful capriculturalist, the comfort and the health of your herd is of prime importance. It's cruel and senseless management to allow your goats to be tethered all day in a hot sun with no provision for shade and no access to water; or to put a goat in a paddock with no shelter from cold and rain; or to allow goats to forage in a certain plot year after year and risk them becoming badly infested with internal parasites.

Goats are hardy animals and are seldom sick or diseased. If a goat appears sick, it should be removed immediately from the herd and placed in a well-bedded box stall away from drafts. If the animal needs to be blanketed, an ordinary feed sack or cotton bag opened at one end will fit the purpose. Remove a triangle from the closed corner of the bag, large enough for the goat to get its head through. Attach a heavy cord to each corner of the sack for tying the blanket to the hind legs or around. A cord just behind the front legs may be used to fasten the blanket at this point.



Trimmed and untrimmed goats' feet

The normal temperature of a goat is 38.9 to 40.0°C, its respiration ranges usually from 12 to 20 and the pulse (heartbeat) ranges from 70 to 80 beats a minute while at rest. A goat's pulse may be taken by placing a finger on an artery lying near the surface at the inside of the lower jaw (near the angle) or by placing your hand over its heart.

If a goat appears to be seriously ill, call your veterinarian immediately.

One badly neglected art that the new capriculturalist should learn is hoof trimming. Its lack will weaken legs, ruin feet and ultimately cripple the animal. Goats soon become used to trimming as a monthly routine. Use a sharp penknife, regular hoof knives or curved hand pruning shears.

Some common goat ailments

(NOTE: When forcing a goat to drink, hold the head so the nose is no higher than level with the eyes. If it chokes or coughs, let go until it has finished coughing, then continue. Never get any liquid into the lungs, you could cause drowning or pneumonia.)

ABSCESSSES Swelling caused by pus, most often found on the skin, udder or jaw, is the result of infection. When a soft spot or head appears, cleanse the area well with disinfectant and then puncture with a sharp knife that has been well sterilized. Press out the pus into a container and cleanse the interior of the abscess with disinfectant. Repeat daily as required.

COLIC A goat suffering from colic will roll on the ground or stretch the body while uttering sharp cries of pain. Keep the goat warm and quiet. Give warm linseed oil or mineral oil, 125 mL for a mature animal down to 10 mL for a kid.

POISONING The symptoms of some kinds of poisoning are similar to those of colic. The goat may appear normal, then stretch its back, cry out in pain and run blindly, often throwing itself to the ground. The time between attacks lessens and eventually the goat dies in convulsions. It may be saved by an intravenous injection of sodium hyposulfite or sodium thiosulfate (15 grains dissolved in 10 mL of distilled water). Have a veterinarian give the injection.

CONSTIPATION In cases of constipation indicated by straining and stretching, it is sometimes necessary to resort to the use of an enema. With older animals, this may be followed by a dose of oil. In treating newborn kids, the enema alone is usually effective.

BLOAT Bloat causes distention of the body most noticeable on the left side. Signs of distress are also evident. For treatment, use 5 mL turpentine and 2 mL essence of peppermint in 250 mL of warm, raw linseed oil or mineral oil. Keep the goat away from green feed for a few days.

ENTEROTOXEMIA (overeating disease, "pulpy kidney") This happens when the stomachs and intestines are so full that the normal bacteria are deprived of air. They then turn toxic, poisoning the animal, usually a youngster. It is most likely to happen in spring and summer when goats have access to lush pasture, or when a kid greedily stuffs itself with milk. To prevent it, ensure correct feeding, on a bulky fibrous diet, and use 'Covexin' or similar vaccine (follow instructions that come with it). To cure it, try two injections, each 10,000 units of penicillin, 4 hours apart. Call the veterinarian.

DIARRHEA Diarrhea may be caused by overeating in a new, luscious, green pasture or by internal parasites. Diarrhea in newborn kids may be caused by neglecting to swab the navel with tincture of iodine at birth. If such infection is the cause, keep the kids clean, warm and dry, and give them 5 mL castor oil and 3 drops essence of peppermint. It may be necessary to call a veterinarian. Treatment of mature goats on pasture consists of removal of the animals to older, drier grazing. Parasites should always be suspected as a cause.

FOOT ROT Infectious foot rot causes decay of the hoof. This may result from pasturing on wet, low lands, or from climbing in stony areas where the feet may be injured and so allow the infective organism to gain entry. Examine the affected part, pare away all dead and diseased tissue, clean well and disinfect the foot with 10% solution of formalin. Bandage the foot to keep it clean and give it daily attention. The animal should be kept in the stall until it has recovered.

INTERNAL PARASITES Goats infected by internal parasites appear rundown and anemic. The hair may be harsh and dry to the touch. For control, thiabendazole compounds and Tramisol work well. These are safe enough to use on pregnant does and are so effective that one dose yearly is sufficient. Follow package instructions (Get sheep type, not cow type).

Tapeworms may be expelled by copper sulphate or lead arsenate preparations. Use as directed by your veterinarian or follow instructions on the label of the proprietary medicine.

MASTITIS OR INFLAMMATION OF THE UDDER This condition may be due to injury and unsanitary surroundings. It is recognized by swollen, hot and reddish appearance of the udder. If the kids are nursing wean them at once and isolate the doe. Treat with an antibiotic and keep the udder milked out. Massaging the udder with warm camphorated oil and applying cloths that have been soaked in hot water will help reduce the inflammation and maintain circulation. Simple, inexpensive mastitis tests are readily available and are cheap health insurance.

OPHTHALMIA This is an infectious inflammation of the eyes. Bathe the eye with warm, previously boiled water and, with a dropper, put in 2 or 3 drops of Argyrol. Keep the animal in a darkened pen.

POX This results in pustules on the udder, similar to cow pox. Nursing kids may easily become infected in the mouth and over the lips and nose. In hand milking, if the hands are not washed after milking a doe with pox, the infection may be carried to other milking does. Wash the affected parts with warm water containing disinfectant, then dry them and apply zinc ointment.

LICE These are generally found in quantity only on housed goats and are easily controlled by dusting with a louse powder. Lousy goats have ruffled hair and appear itchy. Daily brushing helps. Back-oilers, as used for dairy cattle, may be of great help in large herds. In early summer, the goats can be clipped and bathed (guard against their getting a chill); this gets rid of most of the lice and improves their appearance. If insects are a problem, use a wipe-on or spray-on insecticide designed for dairy cattle. Some goats shed their winter coat very well, others do not, and clipping them will speed the new summer coat growing in. Clip them during warm weather, or provide shelter, so they will not be chilled until they adjust to their shorter, cooler coat.

GOATS AND THEIR PRODUCE

The very first thing to do, as said earlier, is to determine why you are buying your goats. What is it you wish to produce? The goat provides the farmer with a wide choice of foodstuffs and byproducts that can be sold. These include milk and dairy products, meat, leather and hides, wool and fertilizer.

Goats' milk and its uses

The value of goats' milk has long been established. Residents of central and southern Europe consider the goat as the dairy animal of that part of the world. It may provide an abundance of fluid milk and, in addition, supply enough cheese and butter for family use. In fact, some 60% of all milk consumed in the world is goat's milk. Because of the minuteness of the fat globules and the presence of enzymes, the milk is valued highly for infants and invalids.

Keep milking goats well groomed. Clip any long, rough hair on thighs, legs and portions of the body surrounding the udder. Milking should be done apart from the area where goats are stabled. Wash and dry the udder, using a clean cloth or paper towels. Since the goat is low, milking stands are recommended. Milk from the side or the rear. Have utensils properly cleaned and sterilized, and wear clean clothing. Cool the milk quickly to around 10°C. Many breeders, confident of the health-promoting value and quality of goats' milk, refuse to pasteurize it.

Dairy cow milk is pasteurized primarily because of a fear of TB, but there has never been a recorded case of TB from goats' milk. However, goats' milk can be pasteurized at home quite easily:

- About half fill the lower part of a double boiler with water.
- Pour the milk into the upper half of the boiler and place a dairy thermometer in it. A boiler of 2.8 L capacity will be required to pasteurize 2 L of milk.
- Heat the milk over hot water until the thermometer registers 60°C. At this stage, reduce the heat as the water will be hot enough to bring the temperature of the milk up from 62 to 65°C. Keep the milk at 65°C for 30 minutes and stir well.
- After 30 minutes, cover the milk immediately and cool to 10°C, or below, in a refrigerator or by placing in ice water.
- Keep the milk cold until used. The milk should be used within 24 hours for infant feeding and within 48 hours for adults.
- All milk must be fresh at the time of pasteurization. All containers and equipment coming in contact with the milk must be kept scrupulously clean, by first washing in cold water, then with hot water, and finally scalding. Dry containers thoroughly in an oven, never with a cloth.

Cheese making

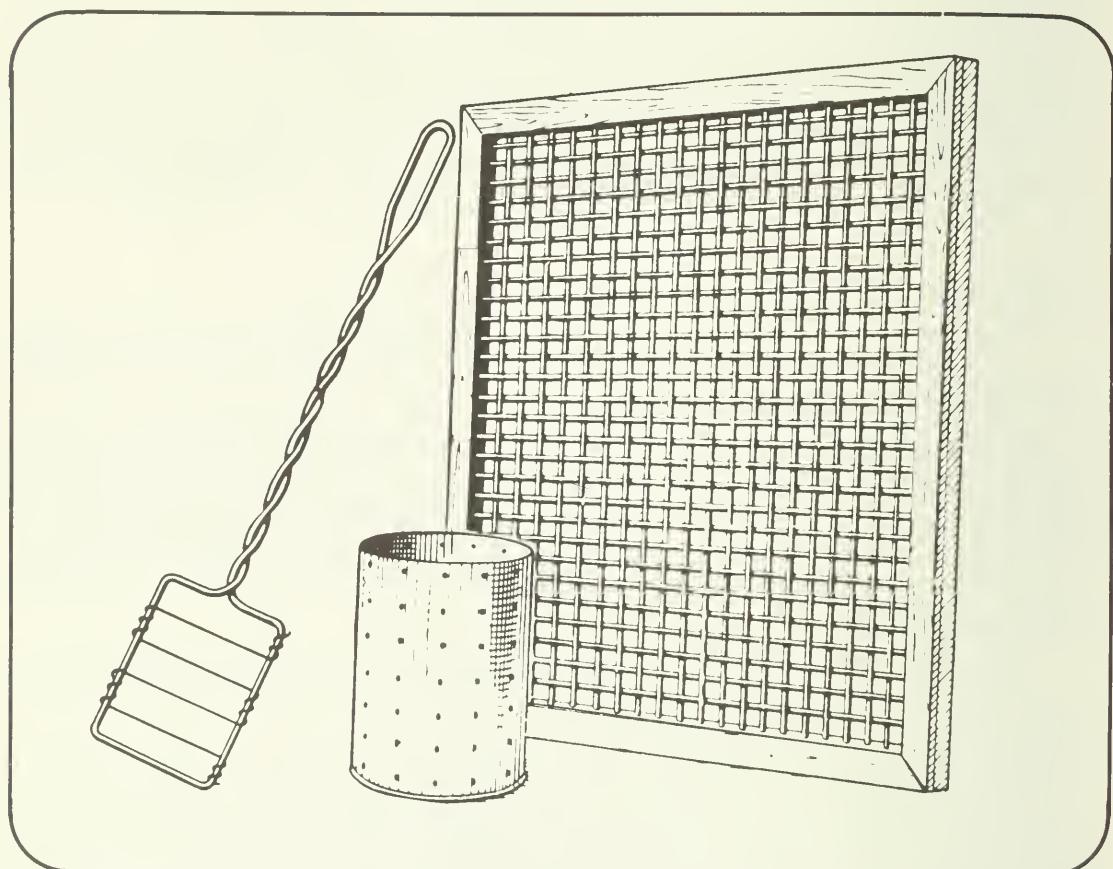
Home cheese-making kits are on the market; these are an excellent way to learn how to make cheese.

Some of the most expensive brands of imported cheese are either wholly or partly made from goats' milk. A commercial formula for the manufacture of cheese from goats' milk in Canada is unavailable but the following domestic formula may be used. You will need a dairy thermometer, rennet tablets, curd cutter, perforated molds, wire draining rack, and milk setting pans.

Use fresh milk, preferably raw. Stir milk, at room temperature, to thoroughly mix in the cream. Measure the milk carefully and heat to 27°C. Add sufficient rennet, in tablet form, to cause the milk to coagulate firmly in about an hour. If too little or too much rennet is used, the cheese will be dry, hard and bitter, and the curd will not set satisfactorily. When the curd is well set, cut it with a thin-bladed knife, first one way then the other, to make cubes of about 13 mm. In place of the knife, a wire cutter may be used. It has been stated that the finer the cut of the curd the richer the cheese. When curd is roughly broken, the fat is lost into the whey and is, therefore, not available for cheese. Stir the cubes gently for about 5 minutes and avoid breaking the curd.

Pour off the surplus whey and place the curd in the molds, which have been placed on a wire screen over a pan to drain the remaining whey. Leave about 24 hours, turning the molds over every few hours. By this time, the curd will have shrunk and may be removed from the mold and spread on a clean, white, cotton cloth set over a wire rack. Shake a heavy coat of salt on the top and sides of the cheese and leave until the

next day when the bottom side should also be well salted. Leave the cheese about 2 weeks in a cool place of even temperature and humidity to cure. During this time, occasionally wipe the cheese with a clean cloth dampened with vinegar to keep mold under control. After 15 days, dip the cheese in paraffin to prevent further mold and to preserve moisture. The curing may be accomplished in a month, but a longer curing period greatly improves the quality of the product. You can make 100 grams of cheese from 1 L of goats' milk. When carefully made, the cheese is delicious, mild and rich, and has a distinctive flavor. Don't throw away the whey; use it in bread, pancakes, etc., or boil it down slowly until it is as thick as peanut butter and use as a cheese spread (add sugar and spices if desired).



Basic cheese-making equipment: a cake-cooling rack, a can with holes (for squeezing the liquid out of the cheese) and a wire curd cutter

Butter making

The fat globules of goats' milk are so small that they are difficult to separate from the milk for butter making. However, the fat may be separated with an ordinary cream separator by making adjustments to the machine. Where a cream separator is not available, the fresh milk may be

poured into shallow pans and set in a cool place; in 10 or 12 hours the cream or fat can be removed in a thick layer. Butter may be made from the fat in the usual way. Since the milk of the goat is very white, you may want to use some butter coloring.

Chevon

Goat meat is a delicacy. It is a lean, high-protein meat which tastes unlike either veal or lamb. Chevon does not retain any trace of 'goaty flavor' unless it is from an uncastrated buck, which is true for any livestock. For example, you cannot sell the meat of an uncastrated hog. Chevon is in great demand, especially on ethnic and gourmet markets. It sells for more than \$4.00 a kilogram liveweight currently.

Try some of these recipes out.

Broiled Chevon Steaks

4 chevon steaks, cut from the leg — 4 cm thick
1 tbsp salad oil
 $\frac{1}{2}$ tsp paprika
Salt and pepper to taste
 $\frac{1}{4}$ tsp oregano or basil

Place steaks on wax paper. Combine the other ingredients and rub steaks on both sides generously. Let stand for 1 hour at room temperature. Place steaks on broiler rack 8 to 10 cm from the heat source. Broil for 8 to 18 minutes depending on your taste, turning for the last 2 minutes. Serve with broiled tomatoes and baked potatoes.

Barley Chevon Stew

1 kg chevon necks, sliced 2 cm thick
flour
Salt and pepper
2 tbsp salad oil
1 cup chopped onions
4 tomatoes, quartered
2 bay leaves
2 tbsp pearl barley
6 prunes, pitted
1 clove garlic, minced
1 tsp paprika
1 cup water
2 tbsp sour cream

Roll chevon in flour, salt and pepper. Brown in the oil over high heat. Add onions, then cover and simmer in water for 10 minutes. Add remainder of ingredients, except sour cream and bake in a 250°F oven for 3 to 4 hours. Add cream and mix thoroughly when ready to serve. Serves 6.

Chevrette on the Spit

This is a traditional Easter delicacy in Greece.

Have your butcher prepare a whole young spring kid that carries about 5 kg of meat. Rub the meat with salt, pepper and minced garlic. Mix together: 2 cups white wine, 2 cups olive oil, oregano and thyme. Rub this mixture into the meat. Place meat in a dish, pouring the remaining liquid over it. Cover the dish with foil and let marinate in refrigerator over night. Place the kid on the spit, securing the legs. Turning constantly, baste the kid with a wine and oil mixture until evenly browned; about ½ hour. Cover with foil and continue cooking until tender, for around 1½ to 2 hours. Remove foil and continue basting for another ½ hour, until well browned.

Mexicali Chevon

3 tbsp butter
3 onions, thinly sliced
1 green pepper, diced
1 cup cooked chevon
1½ cups canned tomatoes
½ cup water
1 tsp chili powder
Salt and pepper to taste
2 cups hot boiled rice

Saute onions and green peppers in butter. Add all remaining ingredients except for the rice and cook over a medium heat until the desired thickness of the sauce has been reached. Add rice to meat mixture and stir well.

Other goat products

In addition to dairy products and meat, there are a number of other products or byproducts that the new capriculturalist should be aware of.

Gardeners love goat dung as fertilizer because it doesn't have a strong smell, it's rich and is already prepelleted. Like any manure, it is best if you compost the dung before use.

It is much harder to enter into a wool operation because you need a large herd. However, never forget the value of cashmere, a wool produced from a species of goat in Kashmir, India.

Leather is also produced from the hides of goats. More than 60 million skins are used to manufacture shoes around the world. Another 60 million skins are transformed into Moroccan leather for our suitcases, bookbinding and so on.

SOME COMMON TERMS

Lactation: the time from freshening until the supply of milk ceases to be produced; usually 10 months, although some goats are “milked through” without breeding for 2 or 3 years.

Freshening: coming into a fresh supply of milk, usually by being bred and having kids, but sometimes a goat will be a “virgin milker” and produce milk without being bred.

Virgin milker: a doe, often a youngster about 1 year old or less, beginning a milk supply without being bred. Some breeders advise it is best to not milk her unless the udder becomes painfully tight. The milk produced this way will not be as great a quantity as that produced the usual way. Most virgin milkers turn out to be good dairy goats.

Dry up (dry off): stopping the production of milk so the doe may have a rest before freshening, usually 8 weeks or more before she gives birth. Goats have a tendency to produce less milk in the winter, and some will dry up by themselves as the pregnancy progresses. A heavy producer needs help to stop; a good method is to quit milking her, cut out grain for a few days, at the same time upset her daily routine, feed poorer (not spoiled) food, and provide less water to drink. If the udder becomes painfully tight, milk off only enough to ease the pressure. Gradually increase the food and grain to the “dry doe” ration once production of milk slows down. It will gradually be absorbed back into the udder, then about 2 to 4 weeks before freshening, the doe will begin to make colostrum milk for the newborn kids.

Dry doe: one that is not producing milk.

Billy goat: the proper term is “buck”.

Nanny goat: the proper term is “doe”.

Disbudding: stopping the growth of horns by burning with heat or chemicals while the kid is young, before the horns have sprouted (1 day to 1 month old).

Dehorning: removing the horns after they have grown; this is much harder on goats than disbudding and there is a greater chance of infection, although it can be done successfully. Not for the novice to attempt; consult a veterinarian.

Wattles: hair-covered tassels, appearing at the throat or below the ears, or on the underside of the upper neck. They are decoration only, having no purpose or meaning. They appear on either sex, of any breed of goat; some have them and some don't. The length varies from 6 mm to about 38 mm; 25 mm is common.

Whether: a castrated male.

Chevon: goat meat, usually kid. Very good, and lean.

Tether: to keep on a rope or chain. Goats get tangled easily, and a rope or chain can twist into a death trap if swivels are not provided. Best places for swivels are on the collar and every 2 to 3 m thereafter. Short tethers, 4 m or less, are best.

Stanchion: bars that lock the goat's neck to hold her in place at the manger, or on the milking stand. Not a good idea for long periods of time, such as overnight.

R.O.P. (Record Of Performance): a government-run official testing program for dairy cows, that is also used for dairy goats. There are few goat herds on this program due to increased regulation and fees.

Colostrum: the milk given after freshening (giving birth) by any mammal mother. It is very rich, thicker, and yellower than 'normal' milk. The baby must get this milk, or a close substitute, to get off to a good start. It gets the bowels working, as well as being rich in albumin, Vitamin A, and antibodies for protection against disease. It is not usually used by humans, but is given to the kids. Any to spare may be frozen in a sterile container for some other newborn kid whose mother hasn't enough, or isn't able to give any.

Registered: a goat that is registered in a breed registry herdbook; generally refers to a purebred.

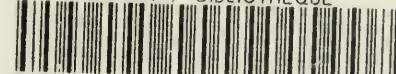
Recorded: often interchanged with the term 'registered', this term is preferably used in reference to a Recorded Grade — an animal that has been upgraded from unregistered stock, using registered bucks (its record of ancestry is kept in the breed registry's herdbooks). The highest level a Recorded Grade can reach is "Canadian of Breed", about 7/8 purebred blood.

Grade: a goat of unknown, or unregistered ancestry. They vary from fine dairy goats to worthless scrubs. It is usually easier for the beginner to start out with grades, as the prices are lower. Good grade does and a quality registered buck make a good foundation herd.

CONVERSION FACTORS

Metric units	Approximate conversion factors	Results in:
LINEAR		
millimetre (mm)	x 0.04	inch
centimetre (cm)	x 0.39	inch
metre (m)	x 3.28	feet
kilometre (km)	x 0.62	mile
AREA		
square centimetre (cm^2)	x 0.15	square inch
square metre (m^2)	x 1.2	square yard
square kilometre (km^2)	x 0.39	square mile
hectare (ha)	x 2.5	acres
VOLUME		
cubic centimetre (cm^3)	x 0.06	cubic inch
cubic metre (m^3)	x 35.31	cubic feet
	x 1.31	cubic yard
CAPACITY		
litre (L)	x 0.035	cubic feet
hectolitre (hL)	x 22	gallons
	x 2.5	bushels
WEIGHT		
gram (g)	x 0.04	oz avdp
kilogram (kg)	x 2.2	lb avdp
tonne (t)	x 1.1	short ton
AGRICULTURAL		
litres per hectare (L/ha)	x 0.089	gallons per acre
	x 0.357	quarts per acre
	x 0.71	pints per acre
millilitres per hectare (mL/ha)	x 0.014	fl. oz per acre
tonnes per hectare (t/ha)	x 0.45	tons per acre
kilograms per hectare (kg/ha)	x 0.89	lb per acre
grams per hectare (g/ha)	x 0.014	oz avdp per acre
plants per hectare (plants/ha)	x 0.405	plants per acre

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